

Portsmouth Atmospheric Science School Project (PASS)

**MU-SPIN Tenth Anniversary Users Conference
and the**

MURED Second Annual Education Conference

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Presented

By

**Dr. Clarence D. Coleman
Associate Vice President of Advancement Services
Norfolk State University
700 Park Avenue
Norfolk, Virginia 23504**

INTRODUCTION

The Portsmouth Atmospheric Science School Project is a partnership between Norfolk State University in cooperation with Cooperating Hampton Roads Organizations for Minorities in

Engineering (CHROME), the NASA Langley Research Center, and Portsmouth Public Schools. The project seeks to strengthen the knowledge of Portsmouth Public School students in the field of atmospheric sciences. (Grades 3 - 5) and middle school students (grades 6 - 8) and teachers through a CHROME club structure. The first year of the project focused on introducing elementary students to concepts and activities in atmospheric science. Project Year 2 will build on the first year's activities and utilize advanced topics and activities appropriate for middle school students.

The Project objectives are as follows for Year 1: 1) Develop program curricula in atmospheric science and a resource guide in conjunction with NSU faculty and NASA Langley Research Center's Office of Education; 2) Establish a school network system using the mathematics and science supervisors as liaisons; 3) Identify three pre-service teachers enrolled at Norfolk State University to assist with this project; 4) Host a workshop for all elementary math and science teachers in the Portsmouth Public School System and pre-service teachers; 5) Identify and train math/science teachers in a minimum of eight of the Portsmouth, Virginia elementary schools to serve as CHROME club sponsors and implement a club in their respective schools; 6) Recruit a minimum of 100 elementary students to participate in the newly established CHROME clubs; 7) Introduce an array of fun, hands-on and creative experiences in atmospheric sciences during monthly CHROME club meetings; 8) Conduct a summer academy, Young PHD's (Persons Having Dreams) in Atmospheric Science, for 30 elementary students. In Year 2, the objectives and strategies will be modified and replicated within the remaining elementary schools in Portsmouth and include four middle schools.

TEACHER TRAINING ACTIVITIES

Throughout the academic year of 1999-2000, Teachers participating in the PASS Project had several opportunities to come together for teacher training activities. There were three official PASS training sessions and two training activities that were open to all CHROME sponsors operating CHROME clubs throughout Hampton Roads.

CHROME Sponsor Launch – “Applying the Tools of Technology to Today’s Classroom” - October 8, 1999 (Regional Program)

Eight PASS sponsors attended the opening program to introduce all teachers to the CHROME program. Teachers were able to receive training in the following areas: Designing Web pages, Creating PowerPoint presentations, Web resources for the Culturally Diverse Classroom, and Space Explorers: Bringing Space Science Down to Earth.

PASS Training Session # 1 - November 4, 1999

Five PASS sponsors and two pre-service teachers attended the initial training session held at Norfolk State University to introduce the grant and to discuss the expectations of the club sponsors. Sponsors were given a pre-test to determine basic knowledge of the atmospheric sciences. Sponsors were introduced to data that had been collected from NASA satellite about temperature changes across the world.

PASS Training Session # 2 - February 23, 2000

Fourteen PASS sponsors and one Portsmouth Public School administrator attended the second official training session held at Douglass Park Earth & Space Elementary. The sponsors received NASA literature such as “Our Mission to Planet Earth” booklet. “**NASA Facts**” sheets included: Satellites - A Global View of Earth; NASA's Mission to Planet Earth: Space-Based Missions - 1994-2000; The Greenhouse Effect; Clouds and the Earth's Radiant Energy System (CERES); The

Earth Science Enterprise Series - Volcanoes and Global Climate Change; HALOE: Tracking ozone loss from Space; Measurement of Air Pollution from Satellites; Clouds and the Energy Cycle; Using Lasers to Study Our Atmosphere, and many others. The sponsors were able to load the NSU/NASA Multimedia CD-ROM called DAACeSS Earth System Science. Teachers were given the Norfolk State University -Project eSS hands-on activity that allowed them to identify the Equator, the Tropics of Cancer and Capricorn, and color a map of the world based on temperature in July. They also received the World Watcher CD-ROM (A visualization program for our world).



Dr. Raj Chadhury, Director of the BEST (Bring Education & Science Together) Lab at Norfolk State University teaches PASS sponsors how to use the NSU/NASA Multimedia CD-ROM called DAACeSS - Earth System Science.

PASS Training
Session #3 -

March 23, 2000

Fourteen PASS sponsors attended a workshop held at Douglass Park Earth & Space Elementary School. The activity was hands on chemistry/atmospheric science based to serve as a model for teachers to use.





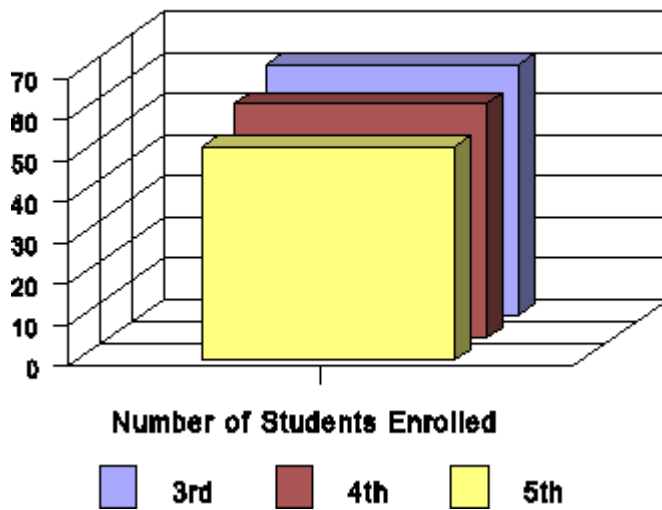
Churchland Primary & Intermediate Sponsors, (left to right) Cherita Long and Wilberta McCoy, along with Lakeview's Sabrina Coleman learn elementary chemistry skills with Dr. Gae Golembiewski, Coordinator of Gifted Programs at Norfolk State University.

ENROLLMENT DATA

PASS Active Schools & Student Enrollment - Year 1

School	Number of Students Enrolled
Churchland Elementary	21
Douglass Park Earth & Space	83
Hodges Manor	14
James Hurst	21
Lakeview	11
Port Norfolk	13
S. H. Clarke Academy	7
Total Students	170

Students per Grade Level



Bar Graph 1 - Students Per Grade Level

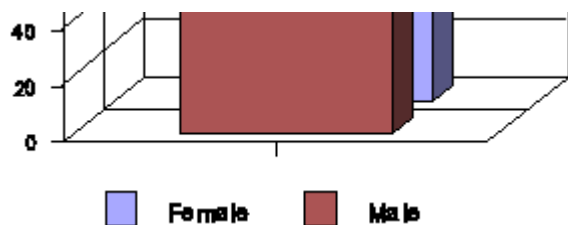
The African-American (Black) culture represents the greatest number of participants in the PASS project totaling 133 students shown in Pie Chart 1 below. The female population as represented in Bar Graph 2 shows their numbers at 99, while the males' population totals 71.

Pie Chart 1 - Race of Students

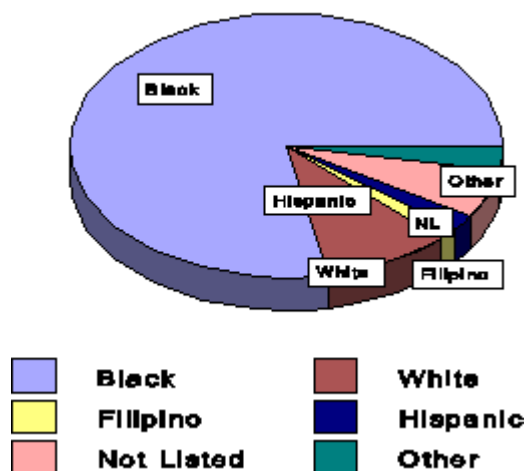
Students

Bar Graph 2 - Gender of

Gender of students



Race of Students



(99) FEMALE (71) MALE

CLUB ACTIVITIES 1999-2000

Club sponsors were given materials relating to atmospheric sciences and trained to conduct activities relating to the topic. Listed below are excerpts from a few of the activities conducted by the schools throughout the academic year. These activities were taken from Activity Reports that are required to be submitted by sponsors at the close of each school year.

Churchland Primary & Intermediate

On February 9, 2000 the PASS Facilitator presented air pressure to the students. The students conducted an experiment called "Air Push" taken from The World in Motion Activity kit. Students reviewed the concepts of air pressure, and performed an activity that blew up their classmates on a plastic garage bag sealed with duck tape and inserted with straws. The students learned that regardless of the student's weight, each child was levitated off the table due to the power of air pressure.

Douglass Park Earth & Space Elementary School

The sponsor of the club secured yearlong volunteers from the National Oceanic and Atmospheric Administration (NOAA). The volunteers introduced a variety of hands-on activities with the students. This club serves 83 students on the ecosystem - water and animal life. Students were introduced to longitude and latitude and the ways that hurricanes are formed. An introduction of Hurricane movement and tracking charts was given and naming hurricanes was also discussed with the students.

Hodges Manor Elementary

Students participated in a computer activity to learn about the atmosphere using the computer software provided at the training session.

James Hurst Elementary

In meeting, students discussed the atmosphere, air, and types of precipitation. During the meeting, students had cloud debate about whether clouds cool or warm the earth. They used materials received from the PASS training activity to conduct their research. During another day students performed experiments to prove that air is real and that it takes up space. For May 2000, Nauticus - The Maritime Museum presented an interactive presentation on weather. Students participated in experiments creating different types of weather (lighting and static electricity).

class=Section3>

Lakeview Elementary

Students examined various units and instruments of measurement. A Measuring Metric Liquid Volume Multimedia kit was used. The students also used a thermometer to measure the temperature of water (cold, room temperature, and hot). They also learned how to read a thermometer (in Celsius and Fahrenheit).

Port Norfolk Elementary

The concept of air pressure was explored. The students conducted an experiment called "Air Push". Students reviewed the concepts of air pressure, and then performed an activity that rose up their classmates on a plastic garage bag sealed with duck tape and inserted with straws. The students learned the regardless of the student's weight each child was levitated off the table due to the power of air pressure.

On May 25, 2000 an array of hands-on activity including experiment involving breaking water down into its chemical components was presented. A student volunteer was asked to hold a hydrogen-filled balloon while holding a ceramic cup below. The instructor held a rod with a birthday candle attached to it. When the burning candle touched the balloon, an explosion was created which sent heat over the heads of the students. They learned that the water created by the experiment evaporated into the atmosphere during the explosion

S.H. Clarke Academy

For the November 1999 meeting, one of the sponsors conducted a workshop entitled "I want to be an astronaut". During the activity, students had the opportunity to learn more about the life of the American Astronauts, the atmosphere, and the ecosystem. This activity was also used to encourage the students to dream and prepare for the future.

BEFORE	AFTER
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Port Norfolk Elementary PASS students learn about the chemical components of water during a presentation from Nauticus – The Maritime Center

SUMMER ACADEMY (Young PHDs)

Title of the Summer Academy: Young PHDs (Persons Having Dreams) in Atmospheric Sciences

Target group: Portsmouth Elementary & Middle School Students – 26 participants

Location of the Program: W.E. Waters Middle School, Portsmouth, VA

Dates of the Program: July 17 - 21, 2000

Teacher: Annie Gunter, Earth Science Teacher from Cradock Middle School in Portsmouth

Outline of Events:

Day 1 - Monday, July 17, 2000

8:45 **Brief introduction of the program**

9:00 **Guest speaker:** Dr. Lin H. Chambers, Atmospheric Scientist
Kathleen C. Powell, Education Specialist
National Atmospheric and Space Administration (NASA) Langley Research Center

Discussion topic: Careers in Atmospheric Science and Cloud formations.
Dr. Chambers discussed her career in Atmospheric Science and how she became interested in the subject. She also talked about her role as a female scientist. The

students traveled outside to look at the clouds and guess the various types of clouds. NASA also provided bags for each child filled with NASA decals and literature about atmospheric sciences.

10:30 Introduction of oral presentations assignments: Based on NASA's Mission to Planet Earth - A Guide to Teaching Earth System Science Book, students were given copies of pages 30-32 involving planet earth careers. Students were given the assignment of presenting a planet earth scientist on the fourth day of the academy. They were also required to bring visual aids.

11:00 Introduction of Mission 1: Describe & Identify Atmospheric Characteristics

Probe 1: Students conducted experiments to discover that air occupies space.

Probe 2: Students conducted experiments to discover that although air is invisible, it has a measurable weight.

Probe 3: Students discussed the components of the atmosphere and investigated the nitrogen content of the air.

Probe 4: Students experiment to discover that air exerts pressure.

Probe 5: Students experiment to discover that warm air expands.

12:30 Lunch

1:30 - 2:30 Continuation of Probe Activity

Day 2 - Tuesday, July 18, 2000

9:00 - 12:00 **Introduction of Mission 2: Atmospheric Energy** - Students investigated how the Earth is heated. They learned that Earth's chief source of energy is the Sun.

12:00 - 12:30 Lunch (Video - The Greenhouse Effect)

12:30

0 - 2:30 **Introduction of Mission 3: Recognize the Relationship between Air Pressure and Wind**
Discussion topics included: Wind Activity, Air Pressure, and WAVY-TV 10 "Weatherschool" Project.

Day 3 - Wednesday, July 19, 2000

9:00 - 12:30 **Introduction of Mission 4: Investigate and Describe How Water Enters and Exits the Atmosphere**
Discussion topics: Clouds, Precipitation, Storms, Weather Observing, and Humidity.

12:30 - 1:30 Lunch

1:30 - 2:30 **Guest speakers:** Norris Wike, Cartographer
Debbie Bland, Cartographer
National Oceanic and Atmospheric Administration (NOAA) in Norfolk, Virginia

The presenters began with a brief discussion of their careers as cartographers. They described

the purpose of NOAA and the methods they use to gather data regarding weather and changes in the atmosphere. Students learned about longitude and latitude and how to track a hurricane by the coordinates.

Day 4 - Thursday, July 20, 2000

9:30 - 11:30 **Field trip to Jefferson Lab:** Students traveled to the Jefferson Laboratory in Newport News for an exciting presentation involving liquid nitrogen, components of light in the spectrum, and discussion of the atmosphere components.

12:30 - 1:00 Lunch

1:00 - 2:30 **Mission 5: Presentations of the Planet Earth Careers** - Each student rendered a presentation about a Planet Earth Career that he or she would like to pursue.

2:30 **Closing Ceremony** Students received certificates during the closing ceremony.

Day 5 - Friday, July 21, 2000

10:30 - 12:30 **Field Trip Day:** Students traveled to the **Rainforest Café** in Norfolk, Virginia to tour the facility and learn about the climate and atmosphere in the Tropics, and the animals. .

1:30 - 3:30 Students traveled to the **Virginia Living Museum** in Newport News to tour the museum and view a presentation in the facility's planetarium, regarding the atmosphere and the stars.

SUMMARY

Categorized below are the outcomes of each of the eight objectives for Year 1 and the goals achieved for each.

1) A curriculum in atmospheric science and a resource guide are still under development. However, a number of NASA and local resources have been collected and distributed to the teachers in order to provide resources for the project. A curriculum was provided, for the Summer 2000 program - Young PHD's (Persons Having Dreams) in Atmospheric Sciences, by a Portsmouth middle school Earth Science educator.

2) A school network system was established with the officials from the Portsmouth Public School System that included the Curriculum Supervisor for Mathematics, the Curriculum Supervisor for Science, and the Director of Instruction for Elementary Education, a key liaison for the project. As a result, an office space was offered at Douglass Park Earth & Space School to serve as the location of the PASS Project office. Club sponsors were able to send correspondence through the school mail system and contact the PASS facilitator at the local office once a week.

The Portsmouth Atmospheric Science School (PASS) was recognized by the school system on May 16, 2000 at the "Celebration of Excellence - Grants Awards Ceremony" at Wilson High School in Portsmouth, Virginia. NASA, NSU, and CHROME officials were invited to the ceremony. The project was recognized for its outstanding contributions to the students of Portsmouth Public Schools. A program display board was prepared and displayed by the program sponsor from James Hurst Elementary School.

3) There were two pre-service teachers that attended them PASS training sessions and assisted in the programs. on November 4, 1999. A greater push will be made in Year 2 to identify additional pre-service teachers and to increase involvement with the club process.

4) Seven elementary PASS programs have been implemented in Year 1. This number is short of the 8 to 10 projected for Year 1. However, every attempt was made by the Principle Investigator and PASS Facilitator to contact the remaining school principals.

6) The student recruitment goal of 100 elementary students was exceed by 70 students. There are currently 170 students enrolled in the program in 7 participating schools.

7) The clubs were involved in fun hands-on activities throughout the year. As described previously. representatives from the National Oceanic and Atmospheric Administration, Nauticus and the National Weather Service.

8) The club activities were supplemented with a summer academic program during the Summer 2000. The program entitled "**Young PHD's (Persons Having Dreams) in Atmospheric Sciences**" was held during the week of July 17 - 21 at Waters Middle School in Portsmouth, Virginia. The program was offered to thirty 5th grade students participating in the PASS project. Students were introduced to concepts surrounding the earth, weather, and changes in our atmosphere. The students conducted fun experiments and had speakers from NASA, the National Oceanic & Atmospheric Administration (NOAA) and the National Weather Service. Students concluded their week with an exciting field trip that brought all the concepts from the program together. The topics for the program were: The Atmosphere- An Ocean of Air, Predicting the

Coming Weather, Measuring Air Pressure, Earth Heat, Temperature of the Atmosphere, Wind, Precipitation, and Air Pollution.